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FITZPATRICK CELLA HARPER & SCINTO
30 ROCKEFELLER PLAZA
NEW YORK, NY 10112

EXAMINER	
MOUTTET, BLAISE L	
ART UNIT	PAPER NUMBER
2853	

DATE MAILED: 12/10/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/803,105	Applicant(s) FUJIBAYASHI ET AL.	
	Examiner Blaise L Mouttet	Art Unit 2853	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 October 2003*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-5 and 7-11* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5 and 7-11* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claim 11 is rejected under 35 U.S.C. 102(b) as being anticipated by Gibson et al. US 5,956,055.

Gibson et al. discloses a printing method for printing an image on a printing medium (14) while relatively moving a printing head (10) provided with an array of a plurality of printing elements (18) and the printing medium (14) comprising the steps of:

relatively moving the printing head (10) and the printing medium (14) in a scanning direction (24) crossing the array of printing elements (18) so that an array of printed pixels corresponding to the array of the printing elements is printed on the printing medium (14) (figure 1, column 3, lines 41-61);

detecting printing positions of the array of printed pixels by detecting printed pixels printed by any of the plurality of printing elements (18) (as described in relation to figure 3 and column 5, lines 65-66); and

controlling drive timing of the plurality of printing elements (18) according to detection results of the printing positions so as to make printing positions of subsequently printed pixels close to a predetermined center position (as described in relation to figures 3 and 4), wherein said controlling step controls drive timing of any of

the printing elements that are determined from the plurality of printing elements (18) to have displacement amounts of printing positions of corresponding printed pixels from a printing position of a printed pixel corresponding to one end side of the array of printing elements equal to or greater than a predetermined amount (E=1 pel) (column 5, lines 65-66) so that a deviation amount between printing positions of printed pixels corresponding to one end side and the other end side of the array of printing elements (18) is equal to or smaller than the predetermined value (E=1 pel) as described in relation to figures 3 and 4 and column 6, lines 3-7.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 2, 4, 5 and 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gibson et al. US 5,956,055 in view of Perner US 6,227,644.

Gibson et al. discloses, regarding claim 1, a printing apparatus for printing an image on a printing medium (14) while relatively moving a printing head (10) provided with an array of a plurality of printing elements (18) and the printing medium (14), said apparatus comprising:

a carriage mounting said printing head (10) and movable relative to the printing medium (14) in a scanning direction (24) crossing said array of printing elements (18) (column 3, lines 41-46);

control means for controlling drive timing of said plurality of printing elements according to determination results of detected printing positions of pixels printed by the print elements so as to make printing positions of subsequently printed pixels close to a predetermined center position, said control means controlling the drive timing of any of the printing elements that are determined from the plurality of printing elements (18) to have displacement amounts of printing positions of corresponding printed pixels from a printing position of a printed pixel corresponding to one end side of the array of printing elements equal to or greater than a predetermined amount (E = 1 pel) (column 5, lines 65-66) so that a deviation amount between printing positions of printed pixels corresponding to one end side and the other end side of the array of printing elements (18) is equal to or smaller than the predetermined value (E = 1 pel) as described in relation to figures 3 and 4 and column 6, lines 3-7.

Regarding claim 2, the control means makes the deviation amount less than E which is the size of one pixel (figures 3 and 4,column 4, lines 61-66).

Regarding claim 4, moving means for the carriage carrying the printing head (10) is necessary to move the printing head in direction (24) and transportation means for the print media (14) is necessary to move the paper in direction (16) as shown and described in relation to figure 1.

Regarding claims 9 and 10, the printing elements (18) contain electrothermal converters (26) for ejecting ink (column 4, lines 1-4).

Gibson et al. fails to disclose, regarding claim 1, that the determination of the printing positions of the pixels is made by detection means mounted on said carriage.

Gibson et al. fails to disclose, regarding claim 5, detection means including a plurality of detection elements arranged on the carriage in a direction crossing the scanning direction.

Gibson et al. fails to disclose, regarding claim 8, detection means comprising a light source and photoelectric detector.

Perner discloses, regarding claims 1, 5 and 8, detection means (15) mounted on a carriage with a printing head (10) to detect ink drop positions from the printing head (figure 1, column 2, lines 13-15). A plurality of detection elements are included crossing the scanning direction (figure 1, column 3, lines 20-28) and the detection means employs light sources and photodetectors (column 3, lines 39-49, column 6, lines 7-17).

It would have been obvious for a person of ordinary skill in the art at the time of the invention to utilize the carriage mounted detector of Perner to determine the ink drop positions as taught by Gibson et al.

The motivation for doing so would have been to finely detect ink drop position for each drop automatically as taught by column 1, lines 57-67 of Perner.

3. Claims 1-4 and 7-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gibson et al. US 5,956,055 in view of Beauchamp et al. US 5,448,269.

Gibson et al. discloses, regarding claim 1, a printing apparatus for printing an image on a printing medium (14) while relatively moving a printing head (10) provided with an array of a plurality of printing elements (18) and the printing medium (14), said apparatus comprising:

a carriage mounting said printing head (10) and movable relative to the printing medium (14) in a scanning direction (24) crossing said array of printing elements (18) (column 3, lines 41-46);

control means for controlling drive timing of said plurality of printing elements according to determination results of detected printing positions of pixels printed by the print elements so as to make printing positions of subsequently printed pixels close to a predetermined center position, said control means controlling the drive timing of any of the printing elements that are determined from the plurality of printing elements (18) to have displacement amounts of printing positions of corresponding printed pixels from a printing position of a printed pixel corresponding to one end side of the array of printing elements equal to or greater than a predetermined amount (E = 1 pel) (column 5, lines 65-66) so that a deviation amount between printing positions of printed pixels corresponding to one end side and the other end side of the array of printing elements (18) is equal to or smaller than the predetermined value (E = 1 pel) as described in relation to figures 3 and 4 and column 6, lines 3-7.

Regarding claim 2, the control means makes the deviation amount less than E which is the size of one pixel (figures 3 and 4,column 4, lines 61-66).

Regarding claim 4, moving means for the carriage carrying the printing head (10) are inherently necessary to move the printing head in direction (24) and transportation means for the print media (14) are inherently necessary to move the paper in direction (16) as described in relation to figure 1.

Regarding claims 9 and 10, the printing elements (18) contain electrothermal converters (26) for ejecting ink (column 4, lines 1-4).

Gibson et al. fails to disclose, regarding claim 1, that the determination of the printing positions of the pixels is made by detection means mounted on said carriage.

Gibson et al. fails to disclose, regarding claim 3, that the printing head is replaceably mounted while detection means is fixed to the carriage.

Gibson et al. fails to disclose, regarding claim 7, a plurality of printing heads mounted on the carriage with detection means wherein the printing heads are controlled based on detection results of the detection means.

Gibson et al. fails to disclose, regarding claim 8, detection means comprising a light source and photoelectric detector.

Beauchamp et al. discloses, regarding claims 1, 3, 7 and 8, a replaceably mounted set of print heads (102-108) placed in a carriage (100) as indicated by column 1, lines 49-53 and figure 2 and detection means (200) comprising light sources and photodetectors (column 6, lines 15-24) fixedly mounted on the carriage (100) to detect ink drop patterns from the print heads and control the print heads accordingly (abstract).

It would have been obvious to a person of ordinary skill in the art at the time of the invention to utilize replaceable printing heads as shown by Beauchamp et al. in the apparatus of Gibson et al.

The motivation for doing so would have been to replace the printing head when it has run out of ink or is faulty as was well known to the art at the time of the invention.

It would have been obvious to a person of ordinary skill in the art at the time of the invention to utilize detection means as taught by Beauchamp et al. to determine the ink drop positions as taught by Gibson et al.

The motivation for doing so would have been to provide appropriate calibration automatically as taught by column 2, lines 46-51 of Beauchamp et al.

Response to Arguments

4. Applicant's arguments filed October 17, 2003 have been fully considered but they are not persuasive.

The applicant alleges that Gibson et al. fails to disclose determining timing control of printing elements on the basis of displacement amounts.

The examiner disagrees. The displacement amount is taught to be determined in column 5, lines 65-66 of Gibson et al. and timing correction of selected printing elements is taught in column 6 of Gibson et al.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Blaise Mouttet whose telephone number is (703) 305-3007. The examiner can normally be reached on Monday-Friday from 8:30 a.m. to 5:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Meier, Art Unit 2853, can be reached at (703) 308-4896. The fax

phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Blaise Mouttet December 1, 2003

Bm 12/1/2003

Primary Examiner
12/8/03